

燃气立管防腐涂层优选试验研究

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摘要: 针对目前燃气立管选用防锈漆涂层而常导致管道外壁腐蚀严重的问题, 制作了燃气立管常规防锈漆涂层、FBE 涂层、3PE 防腐涂层和 3PE 贴锡箔涂层等四类试样, 在相同条件下开展人工加速老化试验, 通过电化学阻抗测试、电火花检漏、扫描电子显微镜等方式评价不同防腐涂层的抗老化性能, 并综合考虑防腐涂层预制质量、施工与修复便捷性、安装维护成本等因素, 对燃气立管防腐涂层进行优选。结果表明, 四类防腐涂层抗老化性能从优到劣的排序依次为 3PE 贴锡箔涂层、FBE 涂层、3PE 防腐涂层、防锈漆涂层。FBE 涂层综合性价比最高, 建议城镇燃气用户立管优先选用该类型涂层。

关键词: 燃气; 立管; 防腐涂层; 抗老化性能; 经济性; 优选

中图分类号: TE88

Experimental study on optimal selection of anticorrosion coating for urban gas riser

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Abstract: Due to the inappropriate application of anticorrosive coating, severe external corrosion of urban gas riser always occurred. Four kinds of anticorrosion coating samples for urban gas riser, i.e., conventional antirust paintcoating, fusion bonded epoxy coating, 3-layer polyethylene coating and 3-layer polyethylene coating with tin foil, were made. The artificial accelerated aging tests for these samples were carried out under the same conditions. The anti-aging performances of different anticorrosion coatings were compared and evaluated by using electrochemical impedance testing, electric spark leak detecting and scanning electron microscope (SEM). Besides, combined with prefabrication quality, construction & repairing convenience, manufacturing cost, the comprehensive cost-effective performances of different anticorrosion coatings were also evaluated. And the optimal anticorrosion coating with the best comprehensive cost-effective performance has been proposed. The results show that fusion bonded epoxy coating has the best comprehensive cost performance, while conventional antirust paintcoating has the worst performance. It is a recommendation that the anticorrosion coating for urban gas riser should adopt fusion bonded epoxy coating to replace conventional antirust paintcoating.

Key words: urban gas; riser; anticorrosive coating; aging resistance; economy; optimization

1 前言

燃气立管目前一般采用涂刷防锈漆的方式进行防腐处理。在外界腐蚀环境、防锈漆本身质量以及涂刷施工质量等因素的综合作用之下, 立管防锈漆一般在 5~10 a 内即会出现严重老化, 失去防腐作用, 如图 1 所示。在后续的运行管理中即便发现立管防腐涂层

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